

ABSTRACT OF THE DISCLOSURE

Method and modem for fast timing recovery of transmitted data between a master xDSL modem and a slave xDSL modem, over a noisy, high loss, high distortion wiring.

Transmitted QAM symbols are received and sampled at the slave modem. The sampled data is split into in-phase and quadrature channels, each of which is filtered by matched filter. The filtered outputs are sampled at twice the symbol rate and the lower and upper band edge components are extracted by modulating each of the sampled sequences of outputs with two discrete time sequences: $\cos(.5 \pi n) = \dots 1, 0, -1, 0, \dots$ and $\sin(.5 \pi n) = \dots 0, 1, 0, -1, \dots$ Each of the resulting products is filtered with a first order low-pass filters and re-sampled again at the symbol rate. The Bit Error Rate is computed, and the slave modem switches from blind timing recovery mode, to data directed timing recovery mode, after the Bit Error Rate has sufficiently decreased.